

REMARKS

By this amendment, claims 1, 2 and 4 have been amended, and claim 11 has been added. Thus, claims 1-11 are now active in the application.

Reexamination and reconsideration of the application are respectfully requested.

The specification and abstract have been carefully reviewed and revised to correct grammatical and idiomatic errors in order to aid the Examiner in further consideration of the application. The amendments to the specification and abstract are incorporated in the attached substitute specification and abstract. No new matter has been added.

Minor amendments to the specification and abstract have been made in order to correct various editorial and idiomatic errors. No new matter has been added by such Amendments.

Attached hereto is a marked-up version of the changes made to the specification and Abstract by the current amendment. The attachment is captioned "Version with markings to show changes made."

In item 3 on page 2 of the Office Action, the Examiner kindly indicated that claims 2-10 would allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. In order to expedite allowance of claims 2-10, each of claims 2 and 4 has now been amended to incorporate thereinto the limitations of claim 1. Accordingly, in view of the Examiner's indication of allowability, it is submitted that claims 2 and 4, as well as claims 3 and 5-10 that depend therefrom, are clearly allowable over the prior art.

In item 2 on page 2 of the Office Action, claim 1 was rejected under 35 USC 102(e) as being anticipated by Hosokawa et al. (US 6,367,811). This rejection is believed moot in view of the above amendments to claim 1. It is thus submitted that the rejection against claim 1 is clearly inapplicable to claim 1 as now amended, for the following reasons.

With exemplary reference to Fig. 4, claim 1 sets forth a lip-type seal 10 with which an outer periphery of a rotational shaft S supported by a predetermined housing H is to be sealed, the lip-type seal comprising: a first reinforcing member 11 formed annularly, the first reinforcing member 11 including a wall surface part 11a defining a hole 11a' through which the rotational shaft S is to be passed and a cylindrical part 11b, 11c bent from an outer edge of the wall surface part 11a; and a first sealing member 12, the first sealing member 12 including an annular base 12a to be joined to the housing H, and a first lip part 12b that extends almost conically inwardly

in a radial direction from the base 12a so as to come into contact with the rotational shaft S; wherein the annular base 12a has an annular concave part 12c formed therein; wherein the cylindrical part 11b, 11c has inner and outer cylindrical walls (e.g. the inner and outer walls of 11b) that extend axially, and both of the inner and outer cylindrical walls are disposed within the annular concave part 12c; and wherein the cylindrical part 11b, 11c is detachably fit in the annular concave part 12c in such a manner that the cylindrical part 11b, 11c can be withdrawn in an axial direction from the annular concave part 12c.

In contrast to the present invention, and with reference to Fig. 8 of the Hosokawa et al. patent, although the Hosokawa et al. arrangement includes a first reinforcing member 9 and a first sealing member 13, the arrangement of these parts significantly differs from that required by claim 1. Specifically, with reference to Fig. 4 of the present application, claim 1 specifies that the cylindrical part 11b, 11c has inner and outer axially-extending walls (e.g. the inner and outer walls of part 11b) which are both disposed within the annular concave part 12c, and it is further required that the cylindrical part 11b, 11c is detachably fit in the annular concave part 12c in such a manner that the cylindrical part 11b, 11c can be withdrawn in an axial direction (leftward direction in Fig. 4) from the annular concave part 12c. On the other hand, in the Hosokawa et al. arrangement, the first reinforcing member 9 does not have a cylindrical part with inner and outer axially-extending cylindrical walls that are both disposed within an annular concave part of the reinforced first sealing member 13. It is also noted that, in Fig. 8 of Hosokawa et al., an outer case 1 has a cylindrical part 4 that is joined to the cylindrical part of the first reinforcing member 9 and has inner brim portions 2, 3. The base portion 5 of the first sealing member 13 is joined to the outside of the cylindrical part 4 of the outer case 1. The first sealing member 13 includes a concave part (within which the L-shaped portion of the part 4 is disposed), but this concave part includes only a small annular concave portion, and also includes a radially inwardly directed concave portion. The L-shaped portion 2 of the part 4 is disposed in the concave part, and cannot be withdrawn axially therefrom.

Thus, as mentioned, in the present invention, the first reinforcing member 11 and the first sealing member 12 are detachably fitted such that the first reinforcing member 9 can be withdrawn from the annular concave part 12c in the axial direction. On the other hand, the Hosokawa et al. arrangement is such that the reinforcing member 9 is not detachably fitted in an

annular concave part of the first sealing member 13, but is rather fitted to the outer case 1, and the sealing member 13 is fitted therewith in the radial direction of the rotational shaft 32, such that the outer case 1 is not easily detachable from the sealing member 13.

Thus, for the above reasons, it is believed apparent that the invention now recited in claim 1 is not anticipated by the Hosokawa et al. patent. Furthermore, the differences are such that there would have been no apparent reason for a person having ordinary skill in the art to modify Hosokawa et al. in such a manner as to result in or otherwise render obvious the present invention of claim 1. Therefore, it is respectfully submitted that claim 1, as well as claim 11 which depends therefrom, are clearly allowable over the prior art of record.

It is noted that the claim language has been slightly revised throughout the claims to clarify that the rotation shaft S and housing H are not themselves part of the lip-type seal of the present invention, as clearly apparent from, for example, Fig. 4 of the present application. However, these revisions to the claim language do not affect the allowability of the claims.

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is clearly in condition for allowance. An early notice thereof is earnestly solicited.

If, after reviewing this Amendment, the Examiner feels there are any issues remaining which must be resolved before the application can be passed to issue, it is respectfully requested that the Examiner contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

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May 7, 2007



Version with Markings to
Show Changes Made

DESCRIPTION

Lip-type seal

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Technical Field

The present invention relates generally to a lip-type seal with which the space between a housing and a rotational shaft, such as that of a compressor used in an air conditioning system of, for example, a vehicle, is sealed, and, more 10 particularly to a lip-type seal that can be recycled.

Background Art

In recent years, the technology for recycling a used lip-type seal has been developed as part of the environmental 15 antipollution measures. As shown in Fig. 1, a conventional lip-type seal formed in consideration of recycling is known (see Japanese Published Unexamined Patent Publication No. 2002-364759, for example). This conventional lip-type seal is made up of a metallic core ring 1, a first ~~rubber~~-made-rubber 20 sealing member 2 that contains the core ring 1 and that is shaped ~~has an almost conical shape~~, a second resinous sealing member 3 that adjoins the first sealing member 2 and that is shaped ~~has an almost conical shape~~, and a metallic backup ring 4 that

adjoins the second sealing member 3.

In this lip-type seal, the first sealing member 2 includes an annular base 2a joined to a housing H, for example, of a compressor, a lip part 2b that defines an inner edge in contact 5 with a rotational shaft S rotatably supported by the housing H, an annular containing part 2c and an incision 2d ~~to~~through which the core ring 1 is fitted in the base 2a. The second sealing member 3 includes a substantially flat outer edge part 3a, and a lip part 3b that defines an inner edge in contact 10 with the rotational shaft S. The backup ring 4 includes a cylindrical part 4a that is fitted to the inside of the base 2a and a wall surface part 4b that defines a circular hole through which the rotational shaft S is passed.

In order to assemble these components, the incision 2d 15 of the first sealing member 2 is greatly widened, and the core ring 1 is inserted into the containing part 2c. Thereafter, the second sealing member 3 is inserted into the inside of the first sealing member 2, and the backup ring 4 is incorporated by fitting the cylindrical part 4a to the inside of the base 20 2a in such a way as to sandwich the second sealing member 3 between the first sealing member 2 and the backup ring 4.

However, in the assemblage into the lip-type seal, there is a need to greatly widen the incision 2d while the base 2a